



# UNITED STATES PATENT AND TRADEMARK OFFICE

*an*  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,633	04/08/2004	Robin Pierce Gardner	5051-631XX	8469

20792 7590 09/29/2006

MYERS BIGEL SIBLEY & SAJOVEC  
PO BOX 37428  
RALEIGH, NC 27627

EXAMINER

HANNAHER, CONSTANTINE

ART UNIT PAPER NUMBER

2884

DATE MAILED: 09/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/820,633	GARDNER, ROBIN PIERCE	
	<b>Examiner</b>	<b>Art Unit</b>	
	Constantine Hannaher	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060703</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Information Disclosure Statement

1. The date of publication supplied for one or more of the publications listed in the information disclosure statement submitted July 3, 2006 does not include the month of publication, but the Examiner makes no requirement on that basis.

### Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Gardner *et al.* (2000).

With respect to independent claim 1, Gardner *et al.* discloses an assembly of recited type (Fig. 5(a)) comprising a radiation source 1, a first gamma ray detector 7, a second gamma ray detector 7, a gamma ray shielding material 8, and a coincidence module (Fig. 5(b)). Bulk material is in sample box 4 (page 522).

With respect to independent claim 13, Gardner *et al.* discloses a method of the recited type corresponding to the illustrated assembly comprising providing the bulk material (page 522) in a radiation region 4, irradiating the bulk material with a radiation source 1 adjacent to the radiation region (Fig. 5(a)), detecting gamma ray events with a first gamma ray detector 7, detecting gamma ray events with a second gamma ray detector 7, shielding gamma rays between the first and second gamma ray detectors with lead wrapping 8, and identifying the gamma ray events that are detected in coincidence in the first and second gamma ray detectors (using coincidence unit in Fig. 5(b)).

4. Claims 2-8, 11, 12-19, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner *et al.* (2000) in view of Wormald (US004841153A).

With respect to dependent claim 2, the gamma ray detectors 7 in the assembly of Gardner do not have the second detector configured as an array. Wormald shows an assembly (Fig. 1) for detecting gamma rays 11, 12, 13 from a bulk material 3 in a radiation region comprising a radiation source 1 configured to irradiate 2 the bulk material in the radiation region, a first gamma ray detector 5 positioned adjacent the radiation region, a second gamma ray detector 6 positioned adjacent the first detector 5, and a coincidence module (analysis circuit 20 or Fig. 4) wherein the second gamma ray detector 6 in the assembly of Wormald comprises an array of gamma ray detectors (column 5, lines 58-60 or Fig. 3). In view of the additional field of view afforded by the array of detectors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the second gamma ray detector 7 in the assembly of Gardner *et al.* to comprise an array.

With respect to dependent claim 3, although Gardner *et al.* does not identify the structures hanging from the sodium iodide detectors 7, the use of photomultiplier tubes for this purpose is so well known as to require no citation. Nevertheless, the assembly of Wormald further comprises a first photomultiplier tube 8 in communication with the first gamma ray detector 5 and a second photomultiplier tube 9 in communication with the second gamma ray detector 6, so it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Gardner *et al.* to specify that photomultiplier tubes were in communication with the first and second gamma ray detectors 7.

With respect to dependent claim 4, the coincidence module in the assembly of Gardner *et al.* is configured as recited (Fig. 6). Also, the analysis circuit 20 in the assembly of Wormald is configured as recited in view of Fig. 2.

With respect to dependent claim 5, the coincidence counting rate shown in Fig. 6 of Gardner *et al.* is the total rate of coincidence between the first and second gamma ray detectors. Also, the coincidence counting rate shown in Fig. 2 of Wormald is the total rate of coincidence between the first and second gamma ray detectors.

With respect to dependent claim 6, the analysis circuit (Fig. 4) in the assembly of Wormald is configured to select a subset of the events from one of the first and second detectors (those events which occur in the scintillators 20, representing the activity of the second gamma ray detector, aligned as a pair) and to identify gamma ray events in the other of the first and second detectors (those events which occur in the scintillator 20 identified as central and representing the activity of the first gamma ray detector) in coincidence with the selected subset (column 8, lines 9-13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Gardner *et al.* to select such subsets in view of the background noise elimination suggested.

With respect to dependent claim 7, the coincidence counting rate shown in Fig. 2 of Wormald is the rate of coincidence between a first event and a second event, wherein the first event and the second event sum to a predetermined energy (where the coincidence rate measured at  $E_4$  is between an event in scintillator A and an event in one of the pairs of scintillators adjacent to A and the events sum to an energy predetermined by the energy of the incident gamma ray and the value 1.022 MeV, column 7, lines 41-59). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Gardner *et al.* to identify such a rate in view of the selectivity suggested.

With respect to dependent claim 8, the predetermined energy in the assembly of Wormald is in the claimed range because the sum of an incident gamma ray energy of greater than 1.022 MeV

(column 8, lines 41-43) and the value of 1.022 MeV (column 7, lines 57-59) establishes a range of 2.044 MeV and greater.

With respect to dependent claim 11, the assembly of Wormald further comprises a conveyor belt configured as recited (column 5, lines 41-42). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Gardner *et al.* to replace table 5 with a conveyor belt such that the bulk material could pass through the radiation region so that more samples could be analyzed.

With respect to dependent claim 14, see the rejection of claim 2.

With respect to dependent claim 15, see the rejection of claim 4.

With respect to dependent claim 16, see the rejection of claim 5.

With respect to dependent claim 17, see the rejection of claim 6.

With respect to dependent claim 18, see the rejection of claim 7.

With respect to dependent claim 19, see the rejection of claim 8.

With respect to dependent claim 22, see the rejection of claim 11.

5. Claims 9, 10, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner *et al.* (2000) in view of Laney (US003626187A).

With respect to dependent claim 9, the coincidence unit in the assembly of Gardner *et al.* is configured to generate a one-dimensional plot (Fig. 6) based on the signals from one of the gamma ray detectors 7. Laney shows that in an assembly with a first detector and a second detector operating in coincidence (Fig. 17) that a one-dimensional plot relating the signals of the first and second detectors to the coincidence count rate (Fig. 1) is inadequate, and that the generation of a two-dimensional plot based on the signals from the first and second detectors (*e.g.*, Fig. 5) is superior for discriminating signal and noise (column 8, lines 64-67). In view of the improved analytical

approach to accepting and rejecting coincident signals as represented by the additional views in Laney, it would have been obvious to one of ordinary skill in art at the time the invention was made to modify the assembly of Gardner *et al.* such that the coincidence unit was configured to generate a two-dimensional plot of the type described by Laney (column 8, lines 7-9) based on the signals from the first and second gamma ray detectors 7.

With respect to dependent claim 10, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a one-dimensional plot such as that shown by Laney (Fig. 1) would be generated based on the two-dimensional plot by its establishment of an acceptance criterion (*e.g.*, Fig. 9) since the overall system (Fig. 17) still counts the sum of coincident pulses meeting the acceptance criterion (column 15, line 58 to column 16, line 12) and the sum-coincidence plot is a part of the conventional summation system modified only by the establishment of the acceptance criterion. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly suggested by Gardner *et al.* and Laney such that one-dimensional diagonal summation plots (representing the contents of the diagonal summations enclosed by the acceptance criterion) were generated based on the two-dimensional plot since such a one-dimensional plot is familiar to users of coincidence equipment.

With respect to dependent claim 20, see the rejection of claim 9.

With respect to dependent claim 21, see the rejection of claim 10.

6. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner *et al.* (2000) in view of Atwell *et al.* (US004582992A).

With respect to dependent claim 12, Gardner *et al.* describe the bulk material in sample box 4 on table 5. Atwell *et al.* shows (Fig. 1) that in an assembly for detecting gamma rays from a bulk material 16 (column 5, lines 38-44) a chute 12 configured to transport the bulk material through the

radiation region established by sources 22 is known. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the assembly of Gardner *et al.* to replace table 5 with a chute such that the bulk material could pass through the radiation region so that more samples could be analyzed.

With respect to dependent claim 23, see the rejection of claim 23.

**Comment on Submission(s)**

7. This application has been published as WO 2004/092719A on October 28, 2004 and again as US 2004/0256566A1 on December 23, 2004.

8. The amendment filed July 3, 2006 has been entered.

9. Applicant's arguments with respect to claims 1-23 have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

10. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on July 3, 2006 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ch

  
Constantine Hannaher  
Primary Examiner